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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,125	05/10/2002	Yasuharu Asano	450101-03685	9907
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EXAMINER WOZNIAK, JAMES S				
ART UNIT		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/019,125

Applicant(s)

ASANO ET AL.

Examiner

JAMES S. WOZNIAK

Art Unit

2626

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 August 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 5-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 5-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 May 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. In response to the Advisory Action from 8/3/2009, the applicant has submitted a Request for Continued Examination (*RCE*), filed 8/13/2009, amending independent claims 1 and 8-9, while arguing to traverse the art rejection based on the limitation regarding second candidate words having a number of phonemes and syllables less than a preset value and first candidate words having a larger number of phonemes and syllables than the second candidate words (*Amendment, Pages 4-5*). Applicant's arguments have been fully considered, however the previous rejection is maintained due to the reasons listed below in the response to arguments.
2. With respect to the previous 35 U.S.C. 112, first paragraph rejection pertaining to a lack of written description, the applicant argues that the amended claims now include that the first candidate words have a number of phonemes and syllables "equal to or above the number and phonemes and syllables of the second candidate words", which is supported in the originally filed specification. The applicant also argues that because the specification does support that the first candidate words have a larger number of phonemes and syllables and that this support was also acknowledged by the examiner in the Advisory Action from 8/3/2009, the amended limitation has sufficient support (*Amendment, Pages 7-9*).

In response, the examiner notes that in the Advisory Action analysis, the specification was considered and it was agreed that there was support for first candidate words having a larger

number of phonemes and syllables than the second candidate words. The currently amended claim, however, recites that the number of phonemes and syllables in the first candidate words can also be "equal" to the number found in second candidate words. The specification, however, makes it clear that the first candidate words are "the words of a larger number of phonemes" (Page 42). Nowhere in the specification is it mentioned that the number of phonemes and syllables of first and second candidate words are equal. In fact, it appears that a system operating under these conditions would actually have difficulty in discerning between the different candidate types, which could lead to inaccurate recognition. Thus, since the specification fails to disclose that first candidate words can have a number of phonemes and syllables equal to that of second candidate words, the 35 U.S.C. 112, first paragraph rejection has been maintained.

Response to Arguments

3. Applicant's arguments have been fully considered but they are not persuasive for the following reasons:

With respect to the amended independent claims, the applicants argues that the prior art of record, namely Doyle (*"Progressive Word Hypothesis Reduction for Very Large Vocabulary Continuous Speech Recognition," 1997*), fails to teach that candidate first words have a number of phonemes and syllables equal to or above a number of phonemes and candidate second words having a number of phonemes and syllables lower than a preset value because they allege that Doyle only teaches boosting the score of more frequent sort words and offers no discussion of "a

preset number of phonemes and syllables for all second candidate words" (Amendment, Pages 10-11).

In response, the examiner has reviewed the amended claim language and applicant's arguments with respect to the prior art of record and finds that Doyle still anticipates the amended limitation. More specifically, Doyle teaches "short word" candidates measured in terms of a number of phonemes (*"a missing phoneme is more costly, the fewer phonemes there are in the word", Section 4.11, Page 37*). Doyle explains that a misrecognized phoneme for these acoustically unstable short words can dramatically affect the recognition of such a word type because of the small number of phonemes in the word leaves little room for speech recognition error (*Section 4.11, Page 37*). In order to be even considered for Doyle's second word type candidate a word is required to meet this "fewer phonemes" designation (*Section 4.11, Pages 37-40*), which corresponds to the claimed "the second candidate words having unstable acoustic characteristic values with a number of phonemes less than a preset value". Looking to Doyle's boosted or second word type candidates, it can be seen that all of these words meet the "fewer phonemes" criteria because the longest words in terms of phonemes are words such as "that", "said", or "five" which consist of three phonemes. Also, phonemes are related to syllables in that they are basic sub-units which either individually or in combination comprise a syllable. So as Doyle's constrained second candidate list analyzes words in terms of shortness, so would Doyle's consideration also include syllables. Looking to Doyle's acoustically unstable word list (*Section 4.1.1, Pages 37-40*), it can be seen that the syllable limit on short words is 1 (*i.e., a short word candidate is required to have < 2 syllables*). Also, in Doyle the first type candidate words would not be considered to be short words, feature more reliable recognition

scores that would cause them to be likely to be picked as candidates with high recognition scores (*Section 4.11, Pages 37-39*), and have a number of phonemes and syllables greater than the numbers in the short word candidate list. Thus since Doyle discloses a fewer phonemes/syllables criteria and a short word candidate list having a phoneme maximum of 3 and a syllable maximum of 1, Doyle teaches second candidate words having a number of phonemes (*i.e., 3 or less*) and syllables (*i.e., less than 2*) less than a preset value, Doyle teaches the aforementioned claim limitation. .

For at least the above reasons, the aforementioned applicants' arguments have been fully considered, but are not convincing.

The art rejections of the dependent are traversed for reasons similar to the independent claims (*Amendment, Page 11*). In regards to such arguments, see the response directed towards the independent claims.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. **Claims 1 and 5-9** are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed

invention. Amended independent claims 1 and 8-9 all recite that a first candidate words have a number of phonemes equal to or above the number of phonemes and syllables of second candidate words. The examiner reviewed the originally filed specification for this limitation, but at best could only find support that the first candidate words have a "larger number of phonemes" (*first candidate words are "the words of a larger number of phonemes", Specification, Page 42*). The specification does not appear to indicate that these candidates have a number of phonemes equal to the second candidate thresholds. Thus, claims 1 and 8-9 and their associated dependent claims are directed to new matter.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. **Claim 1 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al (*U.S. Patent: 5,218,668*) in view of Doyle ("*Progressive Word Hypothesis Reduction for Very Large Vocabulary Continuous Speech Recognition*," 1997).

With respect to **Claims 1 and 8**, Higgins discloses:

Extraction means for extracting characteristic values of said input speech, the input speech comprising a plurality of input words (*speech parameter extraction, Col. 5, Lines 45-63; and input speech corresponding to a word sequence, Col. 6, Lines 16-46*);

Selection means for selecting one or more candidate first words from the plurality of input words to be processed by speech recognition processing, based on a word score that represents an evaluation of acoustic scores and language scores calculated using said characteristic values (*determining a first word hypothesis set based on a matching algorithm utilizing a keyword template, Col. 4, Lines 49-66; Col. 6, Lines 16-46; and syntax language models, Col. 8, Lines 18-26*), and for selecting one or more candidate second words from the plurality of input words based on a second measure different from said first measure (*determining a second word hypothesis set based on a matching algorithm utilizing a filler template relating to keywords, Col. 4, Lines 49-66; and Col. 6, Lines 16-46*);

Score calculation means for calculating said score of said candidate first and candidate second words selected by said selection means referencing concatenation information of said first and second words (*scoring a template string from a concatenation of partial strings of existing candidates located in a phrase buffer with current template candidates, Col. 6, Lines 16-46; and Col. 8, Line 9- Col. 9, Line 65*); and

Finalizing means for finalizing a words string, as the recognition result of said speech based on said score (*finalized recognition output corresponding to a string of most likely word templates, Col. 6, Lines 63-67; and finalizing phrase recognition, Col. 9, Lines 26-54*), wherein the word concatenation information is sequentially updated based on the score (*accumulating scores for partial strings by further concatenating candidates for a current frame to the existing partial strings to produce an updated score, Col. 6, Lines 16-46*).

Although Higgins teaches the selection of alternative speech recognition candidates corresponding to smaller speech units, Higgins utilizes an acoustic distance algorithm in order to

make such a selection and not a non-acoustic selection of candidate words having unstable acoustic characteristic values with a number of phonemes and syllables less than a preset value and a number of phonemes and syllables equal to or greater than the number for selection of first candidates. Doyle, however, teaches the automatic selection of candidate words having acoustically unstable constituents (*i.e., the shortness of the word contributes to acoustic matching inaccuracy because missing phonemes are more costly*) from a defined set of short words having a low number of phonemes and syllables (*i.e., the word "the" consisting of 2 phonemes and see short word list, wherein the words on the list are less than two syllables, Section 4.11, Pages 39-40*) based on an assigned boosting amount, without which the short words would not be selected or missed as candidates (*Section 4.11, Pages 37-40*). Conversely then, in Doyle, the first type candidate words would not be considered to be short words, feature more reliable recognition scores that would cause them to be likely to be picked as candidates with high recognition scores (*Section 4.11, Pages 37-39*), and have a number of phonemes and syllables greater than or equal to the number of syllables/phonemes in the short words.

Higgins and Doyle are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins with the short word selection means taught by Doyle in order to prevent short words from being lost from consideration in a speech recognition process (*Doyle, Section 4.11, Page 37*).

With respect to **Claim 7**, Higgins recites:

The selection means calculates said score using characteristic values of the speech to select said first word based on said score (*extracted speech parameters used in keyword template matching, Col. 5, Lines 45-63; and Col. 6, Lines 16-21*).

8. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins et al in view of Doyle and further in view of Franz et al (*U.S. Patent: 6,178,401*).

With respect to **Claim 9**, Higgins in view of Doyle teaches the speech recognition method, as applied to claim 8, but does not explicitly teach method implementation as a program stored on a computer readable medium. Franz, however, in a similar field of endeavor in speech recognition, further recites implementing a speech recognition method as a program stored on a computer readable medium to enable method implementation on one or more general purpose computers (*Col. 2, Lines 42-67*).

9. **Claims 5-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Higgins in view of Doyle and further in view of Holt et al (*U.S. Patent: 5,960,447*).

With respect to **Claim 5**, Higgins in view of Doyle teaches the speech recognition system utilizing keyword and alternative model matching to generate candidate hypotheses in recognizing an input speech sequence, as applied to claim 1. Higgins in view of Doyle does not teach the use of a storage means for memorizing speech recognition results and using the results in a subsequent alternative recognition, however Holt discloses a means for storing a confidence score from a recognition engine for use in a speech recognition process (*Col. 9, Lines 7-61*).

Higgins, Doyle, and Holt are analogous art because they are from a similar field of endeavor in speech recognition. Thus, it would have been obvious to a person of ordinary skill in the art, at the time of invention, to modify the teachings of Higgins in view of Doyle with the confidence score storage means taught by Holt in order to provide an improved alternative speech recognition means for editing and correcting speech recognition results (*Holt, Col. 1, Line 65- Col. 2, Line 21*).

With respect to **Claim 6**, Holt further recites:

Inputting means for providing an input for correcting the results of speech recognition; wherein said storage means stores the results of the speech recognition corrected by the input from said inputting means (*editing a recognition result and updating a confidence score, Col. 9, Lines 36-61*).

Conclusion

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: See PTO-892.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632. The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached at (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/James S. Wozniak/
Primary Examiner, Art Unit 2626